

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

1-8. (*canceled*)

9. (*previously presented*) Apparatus for inspecting a mask used in microlithography, the apparatus comprising:

a vacuum chamber;

illuminating means for illuminating a mask in the vacuum chamber with extreme ultraviolet light, the illuminating means being disposed inside the vacuum chamber; converter means for converting an image in extreme ultraviolet radiation emitted by the mask into an image in radiation of a longer wavelength, the converter means being disposed inside the vacuum chamber;

sensor means for recording the image in the radiation of a longer wavelength, the sensor means being disposed outside the vacuum chamber; and

an optical interface from the vacuum chamber to the sensor means, the optical interface being arranged as a vacuum window in the vacuum chamber.

10. (*previously presented*) The apparatus of claim 9, wherein the converter means comprises a scintillator.

11. (*previously presented*) The apparatus of claim 9, wherein the converter means forms the optical interface from the vacuum chamber to the sensor means and is arranged as a window in the vacuum chamber.

12. (*previously presented*) The apparatus of claim 9, further comprising imaging optic means disposed in front of the sensor means for reproducing the longer wavelength image on the sensor means, wherein:

at least a part of the imaging optic means is disposed inside the vacuum chamber, and  
at least a part of the imaging optic means forms the optical interface from the vacuum chamber to the sensor means and is arranged as a window in the vacuum chamber.

13. (*previously presented*) The apparatus of claim 12, wherein the imaging optic means is vacuum-tight and forms the optical interface.

14. (*previously presented*) The apparatus of claim 13, where the imaging optic means includes a cement-free hybrid lens having at least one diffractive optical element.

15. (*previously presented*) The apparatus of claim 24, wherein:
- the imaging optic means includes a first lens group having a positive refraction power and a second lens group having a negative refraction power;
- the second lens group is arranged downstream from the first lens group; and
- the diffractive optical element is contained in the first lens group.
16. (*previously presented*) The apparatus of claim 15, wherein the first lens group forms the optical interface.
17. (*previously presented*) The apparatus of claim 16, wherein the first lens group is permanently arranged in the vacuum chamber and the remainder of the imaging optic means is interchangeable in order to change the imaging conditions.

18. (*new*) Apparatus for inspecting a mask used in microlithography, the apparatus comprising:

a vacuum chamber;

illuminating means for illuminating a mask in the vacuum chamber with extreme ultraviolet light, the illuminating means being disposed inside the vacuum chamber;

converter means for converting an image in extreme ultraviolet radiation emitted by the mask into an image in radiation of a longer wavelength, the converter means being disposed inside the vacuum chamber;

sensor means for recording the image in the radiation of a longer wavelength, the sensor means being disposed outside the vacuum chamber; and

an optical interface from the vacuum chamber to the sensor means, the optical interface being arranged as a vacuum window in the vacuum chamber.

19. (*new*) The apparatus of claim 18, wherein the converter means comprises a scintillator.

20. (*new*) The apparatus of claim 18, wherein the converter means forms the optical interface from the vacuum chamber to the sensor means and is arranged as a window in the vacuum chamber.

21. (*new*) The apparatus of claim 18, further comprising imaging optic means disposed in front of the sensor means for reproducing the longer wavelength image on the sensor means, wherein:

at least a part of the imaging optic means is disposed inside the vacuum chamber, and  
at least a part of the imaging optic means forms the optical interface from the vacuum chamber to the sensor means and is arranged as a window in the vacuum chamber.

22. (*new*) The apparatus of claim 21, wherein the imaging optic means is vacuum-tight and forms the optical interface.

23. (*new*) The apparatus of claim 22, where the imaging optic means includes a cement-free hybrid lens having at least one diffractive optical element.

24. (*new*) The apparatus of claim 23, wherein:

the imaging optic means includes a first lens group having a positive refraction power and a second lens group having a negative refraction power;  
the second lens group is arranged downstream from the first lens group; and  
the diffractive optical element is contained in the first lens group.

25. (*new*) The apparatus of claim 24, wherein the first lens group forms the optical interface.

26. (*new*) The apparatus of claim 25, wherein the first lens group is permanently arranged in the vacuum chamber and the remainder of the imaging optic means is interchangeable in order to change the imaging conditions.